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School of Mathematical Sciences,
Universiti Sains Malaysia,
11800 USM Penang, Malaysia

Tel : +604 653 3284
Fax : +604 657 0910
E-mail : dean_mat@usm.my

● ACADEMIC SESSION
2021/2022



B. SC (HONS.) MATHEMATICS

SCHOOL OF MATHEMATICAL SCIENCES
UNIVERSITI SAINS MALAYSIA

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SCHOOL OF MATHEMATICAL SCIENCES

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INTRODUCTION

The School of Mathematical Sciences was established on May 29, 1974. As with the other science schools, the School of Mathematical Sciences offers the Bachelor of Science and Bachelor of Applied Science degrees. In addition, the school is also involved running mathematics courses for various programme in the University degrees.

The Bachelor of Science (Mathematics) programme is formulated in an effort to produce graduates who are well-trained in the Mathematical Sciences to meet the nation's manpower needs. The curriculum is devised so as to provide a broad-based and rigorous mathematics education. The skills obtained at the end of the program will provide a firm foundation for the graduates to further advance their knowledge in Mathematical Sciences.

VISION

To be a recognized department of mathematics that can attract excellent students and produce quality mathematicians nationally and internationally.

MISSION

To lead and innovate in achieving excellence in mathematical sciences at the international level through advancing and disseminating knowledge and truth; instilling qualities that stress academic excellence and professionalism; developing holistic individuals; and providing a strong commitment towards the society aspiration; the country's vision and universal aspirations.

PROGRAMME OBJECTIVES

Graduates of Bachelor of Science (Mathematics) will:

1. Excel in mathematical practices in various sectors.
2. Establish themselves as leaders in their career.
3. Enrol for an advanced degree or professional certificate.

PROGRAMME LEARNING OUTCOMES

At the end of the programme, the students will possess:

1. Knowledge
 - Describe and apply fundamental knowledge of Mathematics and Applied Mathematics in various activities.
2. Practical skills
 - Select and apply practical skills such as mathematical techniques, tools and resources to various activities.
3. Cognitive Skills
 - Identify and analyse problems to formulate solutions using logical reasoning, critical thinking and scientific skills.
4. Communication Skills
 - Communicate effectively and efficiently in both oral and written form whether as an individual, or in a team setting.
5. Interpersonal Skills
 - Demonstrate effectively social skills, teamwork and also social responsibilities as an individual.
6. Ethics and Professionalism
 - Demonstrate and practice appropriate values, attitudes and professionalism at all times.
7. Personal Skills
 - Apply acquired knowledge to adapt with latest information whilst constantly learning new skills and capabilities.
8. Entrepreneurial Skills
 - Apply knowledge and understanding of project management and acquire entrepreneurial skills in handling various projects and activities.
9. Leadership, Autonomy and Responsibility
 - Possess the characteristics of an articulate, decisive, innovative and responsible leader.
10. Digital Skills
 - Gain the ability to apply programming knowledge in problem solving.
11. Numeracy Skills
 - Employ the mathematical and statistical knowledge in providing precise and accurate computational solutions.

STAFF AND ADMINISTRATION

DEAN



Professor Dr. Hailiza Kamarulhaili

DEPUTY DEANS



Assoc. Prof. Dr. Lee See Keong
Acting Deputy Dean
(Academic, Career & International)



Associate Professor Dr. Farah Aini Abdullah
(Industry-Community Engagement)

PROGRAMME CHAIRPERSONS



Assoc. Prof. Dr. Lee See Keong
Science
(Mathematics)



Dr. Ahmad Lutfi Amri Ramli
Applied Science
(Mathematical Modelling)



Dr. Norhashidah Awang
Applied Science
(Mathematics and Economics)



Dr. Fam Pei Shan
Applied Science
(Applied Statistics/ Operations Research)



Dr. Yazariah Mohd. Yatim
Facility & Teaching Development
Co-ordinator

ASSISTANT REGISTRARS



Mrs. Nur Akmar Idris
Principal Assistant Registrar



Mr. Ahmad Wafi Sahedan
Assistant Registrar

ADMINISTRATION

DEAN

Prof. Dr. Hailiza Kamarulhaili

E-mail

dean_mat@usm.my

ACTING DEPUTY DEAN

(ACADEMIC, CAREER & INTERNATIONAL)

Assoc. Prof. Dr. Lee See Keong

ddsa_mat@usm.my

DEPUTY DEAN

(INDUSTRY-COMMUNITY ENGAGEMENT)

Assoc. Prof. Dr. Farah Aini Abdullah

ddpg_mat@usm.my

PROGRAMME CHAIRPERSONS

SCIENCE (MATHEMATICS)

Assoc. Prof. Dr. Lee See Keong

sklee@usm.my

APPLIED SCIENCES

(MATHEMATICS AND ECONOMICS)

Dr. Norhashidah Awang

shidah@usm.my

APPLIED SCIENCES

(APPLIED STATISTICS/OPERATIONS RESEARCH)

Dr. Fam Pei Shan

fpeishan@usm.my

APPLIED SCIENCE

(MATHEMATICAL MODELLING)

Dr. Ahmad Lutfi Amri Ramli

alaramli@usm.my

FACILITY & TEACHING DEVELOPMENT CO-ORDINATOR

Dr. Yazariah Mohd. Yatim

yazariahmy@usm.my

PRINCIPAL ASSISTANT REGISTRAR

Mrs. Nur Akmar Idris

nur_akmar@usm.my

ASSISTANT REGISTRAR

Mr. Ahmad Wafi Sahedan

wafi@usm.my

ACADEMIC STAFF

PROFESSOR

Rosihan M. Ali, Dato' Indera Dr
Hailiza Kamarulhaili, Dr
Michael Khoo Boon Chong, Dr

**TELEPHONE
EXTENSION**

3966
3648
3941

E-MAIL

rosihan@usm.my
hailiza@usm.my
mkbc@usm.my

ASSOCIATE PROFESSOR

Andrew Rajah, Dr
Ang Miin Huey, Dr
Farah Aini Abdullah, Dr
Husna Hasan, Dr
Lee See Keong, Dr
Mohd. Tahir Ismail, Dr
Noor Atinah Ahmad, Dr
Saratha A/P Sathasivam, Dr
Sek Siok Kun, Dr
Teh Su Yean, Dr

4780
4772
4765
4773
2070
2071
4767
2428
5338
4770

andy@usm.my
mathamh@usm.my
farahaini@usm.my
husnahasan@usm.my
sklee@usm.my
m.tahir@usm.my
nooratinah@usm.my
saratha@usm.my
sksek@usm.my
syteh@usm.my

SENIOR LECTURER

Adila Aida Azahar, Dr
Ahmad Lutfi Amri Ramli, Dr
Amirah Azmi, Dr
Azhana Ahmad, Dr
Fam Pei Shan, Dr
Hajar Sulaiman, Dr
Kong Voon Pang, Dr
Johnny Lim Khai Yang, Dr
Maisarah Haji Mohd, Dr
Md Yushalify Misro, Dr
Mohd Hafiz Mohd, Dr
Ng Zhen Chuan, Dr
Noor Saifurina Nana Khurizan, Dr
Norazrizal Aswad Abdul Rahman, Dr
Norhashidah Awang, Dr
Norshafira Ramli, Dr
Nur Nadiah Abd Hamid, Dr
Nuzlinda Abdul Rahman, Dr
Ong Wen Eng, Dr
Rosmanjawati Abdul Rahman, Dr
Shamani A/P Supramaniam, Dr
Shamsul Rijal Muhammad Sabri, Dr
Shareduwan Mohd Kasihmuddin, Dr

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3964
4769

adilaazahar@usm.my
alaramli@usm.my
amirahazmi@usm.my
azhana@usm.my
fpeishan@usm.my
hajars@usm.my
kongvp@usm.my
johnny.lim@usm.my
maisarah_hjmohd@usm.my
yushalify@usm.my
mohdhafizmohd@usm.my
zhenchuanng@usm.my
saifurina@usm.my
aswad.rahman@usm.my
shidah@usm.my
norshafiraramli@usm.my
nurnadiah@usm.my
nuzlinda@usm.my
weneng@usm.my
rosmanjawati@usm.my
shamani@usm.my
rijal@usm.my
shareduwan@usm.my

Siti Amirah Abd Rahman, Dr	2355	amirahr@usm.my
Siti Noor Farwina Mohamad Anwar Antony, Dr	3965	farwina@usm.my
Syakila Ahmad, Dr	3945	syakilaahmad@usm.my
Teh Wen Chean, Dr	4777	dasmenteh@usm.my
Yazariah Mohd Yatim, Dr	4783	yazariahmy@usm.my
Zainudin Arsad, Dr	2069	zainudin.arsad@usm.my

SUPPORT / TECHNICAL STAFF

Siti Salmah Harun	Office Secretary
Nur Atiqah Jamaluddin	Office Secretary
Fazril Ezwan Shafii	Administrative Assistant (Clerical/Operation)
Hartini Ahmad	Information Technology Assistant Officer
Hasliza Razali	Chief Clerk
Mohd Zaidul Khair Mansor	Administrative Assistant (Clerical/Operation)
Noraidah Zamaludin	Administrative Assistant (Clerical/Operation)
Nor 'Izzati Zaidi	Administrative Assistant (Clerical/Operation)
Nor Rafidah Abd Majid	Administrative Assistant (Clerical/Operation)
Nur Insyirah Abd Manaf	Administrative Assistant (Clerical/Operation)
Syed Mohamed Hussain Syed Osman	Engineering Assistant Officer

PROGRAMME REQUIREMENT

Type of Courses	Classification	Unit
Core	T	70
Minor / Elective	M / E	36*
University	U	20
Total Number of Units		126

The required 70 units for Core are fulfilled from the courses listed below.

- * Students who opt for **Minor** need to accumulate 20 units from a minor package, and the remaining 16 units from the elective courses in a specific track.
- * Please refer to the book of Minor Programmes Guideline. Any Minor Programme offered by other schools can be taken by the Mathematics students, subject to the requirements imposed by the school which offers the Minor Programme. Examples of popular programmes are Management, Computer Science, Communications, Psychology, English or other Sciences.
- * Students who opt for **Elective** are required to complete 36 units from Elective Courses or any courses offered by the School of Mathematical Sciences. Other courses may be taken subject to approval from the Dean.

CORE COURSES

A student has to accumulate 70 units as follows:

MAT100/4	:	Mathematical Foundations
MAT101/4	:	Calculus
MAT111/4	:	Linear Algebra
MAT161/4	:	Elementary Statistics
MAT181/4	:	Programming for Scientific Applications
MAT201/4	:	Advanced Calculus
MAT202/4	:	Introduction to Analysis
MAT203/4	:	Vector Calculus
MAT223/4	:	Differential Equations I
MAT251/4	:	Introduction to Operations Research
MAT263/4	:	Probability Theory
MSS212/4	:	Further Linear Algebra
MSS311/4	:	Modern Algebra
MAT323/4	:	Differential Equations II
MSG328/4	:	Introduction to Modelling
MSS381/2	:	Mathematical Software Laboratory
MAT382/4	:	Introductory Numerical Methods
MSS492/4	:	Project

ELECTIVE COURSES (Track 1)

MAT363/4	:	Statistical Inference
MSS401/4	:	Complex Analysis
MSS402/4	:	Real Analysis
MSS415/4	:	Introductory Functional Analysis
MSS416/4	:	Rings and Fields
MSS417/4	:	Coding Theory
MSS418/4	:	Discrete Mathematics
MSS419/4	:	Geometry
MSS482/4	:	Graphing Technology in Mathematics and Science

ELECTIVE COURSES (Track 2)

MSG370/4	:	Mathematics of Finance
MSG384/4	:	Introduction to Geometric Modelling
MSS419/4	:	Geometry
MSG422/4	:	Fluid Mechanics
MSG427/4	:	Environmental Modelling
MSS482/4	:	Graphing Technology in Mathematics and Science
MSG488/4	:	Mathematical Algorithms for Computer Graphics
MSG489/4	:	Numerical Methods for Differential Equations

ELECTIVE COURSES (Track 3)

MSG352/4	:	Linear and Integer Programming
MSG354/4	:	Network Flows
MSG355/4	:	Inventory Control
MAT363/4	:	Statistical Inference
MSG453/4	:	Queuing System and Simulation
MSG455/4	:	Game Theory
MSG456/4	:	Mathematical Programming

OPTIONAL UNIVERSITY COURSES

In order to fulfil this requirement, students of the School of Mathematical Sciences are allowed to take any course outside the Schools of Mathematical Sciences, Chemical Sciences, Biological Sciences and Physics. Students are encouraged to take English language [LHP code], foreign languages, thinking techniques, history and philosophy of science courses.

COURSE PRE-REQUISITE AND SEMESTER OF OFFERING

The prerequisites and offering semester for the core and elective courses are as follows:

	Code & Title of Courses	Prerequisite	Semester Offered
1.	MAT100/4 : Mathematical Foundations	-	1
2.	MAT101/4 : Calculus	-	2
3.	MAT111/4 : Linear Algebra	-	2
4.	MAT161/4 : Elementary Statistics	-	2
5.	MAT181/4 : Programming for Scientific Applications	-	1
6.	MAT201/4 : Advanced Calculus	MAT101 (S)	1
7.	MAT202/4 : Introduction to Analysis	MAT201 (S)	2
8.	MAT203/4 : Vector Calculus	MAT201 (S)	2
9.	MSS212/4 : Further Linear Algebra	MAT111 (S)	1
10.	MAT223/4 : Differential Equation I	MAT101 (S) and MAT111 (S)	1
11.	MAT251/4 : Introduction to Operations Research	MAT111 (S) and MAT161 (S)	2
12.	MAT263/4 : Probability Theory	MAT161 (S) and MAT201 (S)	2
13.	MSS311/4 : Modern Algebra	MAT111 (S)	2
14.	MAT323/4 : Differential Equation II	MAT223 (S)	1
15.	MSG328/4 : Introduction to Modelling	MAT223 (S)	2
16.	MSG352/4 : Linear and Integer Programming	MAT251 (S)	1
17.	MSG354/4 : Network Flows	MAT251 (S)	2
18.	MSG355/4 : Inventory Control	MAT251 (S)	2
19.	MAT363/4 : Statistical Inference	MAT263 (S)	1
20.	MSG370/4 : Mathematics of Finance	MAT201 (S)	1
21.	MSS381/2 : Mathematical Software Laboratory	MAT181 (S)	2
22.	MAT382/4 : Introductory Numerical Methods	MAT181 (S)	1
23.	MSG384/4 : Introduction to Geometric Modelling	MAT181 (S) and MAT201 (S)	2
24.	MSL399/4 : Industrial Training	At least accumulated 90 units	1
25.	MSS401/4 : Complex Analysis	MAT201 (S)	1
26.	MSS402/4 : Real Analysis	MAT202 (S)	2
27.	MSS415/4 : Introductory Functional Analysis	MAT111 (S) and MAT202 (S)	1

28.	MSS416/4	: Rings and Fields	MAT111 (S) and MSS311 (S)	2
29.	MSS417/4	: Coding Theory	MAT111 (S) and MSS311 (S)	1
30.	MSS418/4	: Discrete Mathematics	MAT111 (S) and MAT263 (S)	2
31.	MSS419/4	: Geometry	MAT111 (S) and MAT203 (S)	1
32.	MSG422/4	: Fluid Mechanics	MAT203 (S) and MAT323 (S)	2
33.	MSG427/4	: Environmental Modelling	MSG328 (S)	1
34.	MSG453/4	: Queuing System and Simulation	MAT181 (S) and MAT263 (S)	1
35.	MSG455/4	: Game Theory	MAT251 (S)	1
36.	MSG456/4	: Mathematical Programming	MAT201 (S) and MAT251 (S)	1
37.	MSS482/4	: Graphing Technology in Mathematics and Science	MAT111 (S), MAT223 (S) and MAT263 (S)	1
38.	MSG488/4	: Mathematical Algorithms for Computer Graphics	MSG384 (S)	1
39.	MSG489/4	: Numerical Methods for Differential Equations	MAT382 (S)	1
40.	MSS492/4	: Project	MAT202 (S) and MSS311 (S)	2

Sequential prerequisite (S) means if course A is a sequential prerequisite (S) to course B, then course A must be taken and assessed before course B is taken.

Concurrent prerequisite (C) means if course A is a concurrent prerequisite (C) to course B, then course A and course B can be taken at the same time (concurrently).

CORE AND ELECTIVE COURSES REGISTRATION GUIDE

Year of Study	Semester 1	Units	Semester 2	Units
1	MAT100	3	MAT101	4
	MAT181	4	MAT111	4
			MAT161	4
2	MAT201	4	MAT202	4
	MSS212	4	MAT263	4
	MAT223	4	MAT203	4
			MAT251	4
3	MAT323	4	MSS311	4
	MAT382	4	MSS381	2
	*†MAT363	4	MSG328	4
	†MSG352	4	†MSG354	4
	^MSG370	4	†MSG355	4
			^MSG384	4
4	*MSS401	4	MSS492	4
	*MSS415	4	*MSS402	4
	*MSS417	4	*MSS418	4
	*^MSS419	4	*MSS416	4
	*^MSS482	4	^MSG422	4
	^MSG427	4		
	†MSG453	4		
	†MSG455	4		
	†MSG456	4		
	^MSG488	4		
	^MSG489	4		

*- Track 1, ^ - Track 2, † - Track 3

SCHOOL'S FACILITIES

The School of Mathematical Sciences has 3 undergraduate computer laboratories, a postgraduate computer laboratory and a research and development laboratory. These laboratories use Microsoft Windows operating System and are equipped with mathematical software.

GENERAL INFORMATION

Awards

Besides awards from the University, there are 3 other specific awards for mathematics students:

1. Tan Sri Dato' Professor Sir Alexander Oppenheim Book Prize for the best first year student.
2. Dato' Abdul Razak Yusof Gold Medal Award to the best final year student in the field of Mathematical Sciences.
3. Telesol Sdn. Bhd. Gold Medal Award to the best final year student in the field of Applied Sciences (Mathematics).

The Dean Lists certificates are awarded every semester to excellent students who have obtained a GPA of at least 3.5 and accumulated at least 14 units.

The Dean Award will be conferred to a student who has excelled in both the academic and co-curriculum activities. Only one award is available for each year of study from each programme. A student of a CGPA of 3.7 and above in an academic session is qualified to be considered for this award.

Mathematical Sciences Society

This society organizes various activities in order to promote Mathematics amongst USM and secondary school students. Students of School of Mathematical Sciences are encouraged to join this society.

Graduate Programme

The School also offers the following graduate programme:

- Master of Science (Mathematics) by research
- Master of Science (Statistics) by research
- Mixed Mode Master of Science (Mathematics)
- Mixed Mode Master of Science (Statistics)
- Master of Science (Teaching of Mathematics) by course-work
- Doctor of Philosophy by research